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EXAMINER	
BROOME, SAID A	
ART UNIT	**PAPER NUMBER**
2671	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/816,474	SEPULVEDA, MIGUEL A.
	Examiner	**Art Unit**
	Said Broome	2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-93* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-93* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9/20/04; 9/14/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-11, 13-17, 19-30, 33-46, 48-59, 62-75, 77-88 and 91-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milliron (US Patent 6,608,631) in view of Silva et al.(US Patent 6,061,067).

Regarding claims 1, 36 and 65, Milliron teaches converting a geometric representation of an object into a data stream in column 2 lines 51-55 and is also illustrated in Figure 7a as element 7150. Milliron also teaches that the deformation is performed by graphics hardware, therefore the data passes through a data stream of a pipeline or graphics processor as known in the art, and is also described in column 9 lines 64-67 and column 10 lines 8-10. Milliron also teaches receiving the data and applying a deformation to the data stream in column 2 lines 55-59 and is also illustrated in Figure 7a as element 7750. Milliron teaches converting the deformed data into a geometric representation of a deformed object in column 3 lines 7-9 and is illustrated in Figure 7a as element 7850. However, Milliron fails to specifically teach a head node, a plurality of deformation nodes and a tail node. Silva et al. illustrates a head node 210 in Figure 2 that converts a geometric representation of an object as described in column 11 lines 54-55 that is sent to the pipeline 250 through a data stream. Silva et al. also teaches a plurality of deformation nodes in column 4 lines 60-67, which are described to perform deformation on the

3D object, and is also illustrated in Figure 1. Silva et al. teaches a deformation or transformation node 230 that receives data from a node and applies deformation to the data as described in column 11 lines 11-21, and a tail node 270 that converts the deformed data into a geometric representation of a deformed or transformed object as described in column 11 lines 48-53 and 63-66. Regarding claims 1 and 35, Silva also teaches an animation deformation pipeline and method in Figure 2, as recited in the respective preambles. Regarding claim 65, Milliron teaches a computer program product for deforming a computer-generated object using inherently using a graphics hardware or deformation pipeline in column 10 lines 11-14, as recited in the preamble. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron with Silva et al. because this combination would provide accurate deformation of various geometric models that are passed through a deformation pipeline, thereby reducing the time required to independently generate deformations for individual objects.

Regarding claims 2, 37 and 66, Milliron teaches applying deformation in response to manipulation of a polygonal proxy model in the progression through Figures 16A–16D, where deformation is shown to enable the deformation of a proxy model. Milliron fails to teach at least a subset of the deformation nodes applying deformation. Silva et al. teaches at least a subset of deformation nodes in column 4 lines 27-48 and Figure 1 as elements 192 and 194, that apply deformation in response to manipulation of a 3D object, as described in column 8 lines 18-25 and is shown in Figure 6. The motivation to combine the teachings of these references is equivalent to the motivation of claim 1.

Regarding claims 3, 38 and 67, Milliron fails to teach a deformation node passing the data stream to a succeeding node. Silva et al. illustrates a deformation passing a data stream to a

succeeding node in Figure 2 where it is shown that the deformation node 730 passes data to succeeding nodes 240 and 270. The motivation to combine the teachings of these references is equivalent to the motivation of claim 1.

Regarding claims 4, 39, and 68, Milliron teaches a sequential binding mode in column 25 lines 43-48 where it is described that new deformations may be sequentially applied to previously deformed surfaces, which modifies the previously applied deformation and enables correction or modification of undesired features, as illustrated in correction of the cloth during the progression through Figures 15A-D. Milliron fails to teach at least a subset of deformation nodes that apply deformation. Silva et al. teaches at least a subset of deformation nodes in column 4 lines 27-48 and Figure 1 as elements 192 and 194, which apply deformation. The motivation to combine the teachings of these references is equivalent to the motivation of claim 1.

Regarding claims 5, 40 and 69, Milliron fails to teach at least a subset of deformation nodes that apply deformation to the result of a previous deformation node. Silva et al. teaches at least a subset of deformation nodes in column 4 lines 27-48 and Figure 1 as elements 192 and 194, which apply deformation may apply a deformation to the result of another deformation as described in column 4 lines 37-48 where an object is bent and then the resulting deformed object is then twisted using the nodes 192 and 194 respectively from Figure 6. The motivation to combine the teachings of these references is equivalent to the motivation of claim 1.

Regarding claims 6, 41, 44, 45, 70, 73 and 74, Milliron teaches that the representation of a point of a model to be deformed is used to generate a deformed model, as described in column 11 lines 9-22. Though the reference does not explicitly teaches a representation of a point

within a data stream, Milliron teaches that the deformation is performed by graphics hardware, therefore the data passes through a data stream of a pipeline or graphics processor as known in the art, and is also described in column 9 lines 64-67 and column 10 lines 8-10, therefore the representation of the point is inherently passed to a succeeding node to generate the representation of the deformed point, as illustrated in Figure 3B.

Regarding claims 7, 42 and 71, though Milliron teaches a parallel binding mode in column 25 lines 63-67, column 26 lines 1-10 and as shown Figures 16B, where two control vertices 16200 and 16100, that bind an original object are each modified together to perform deformation to the object, resulting in the combined deformation of both vertices, as illustrated in Figure 16D.

Regarding claims 8, 43 and 72, Milliron teaches applying deformation to a polygonal proxy model in the progression of Figures 16A-D and 17A-D, therefore the teachings of Milliron would also provide applying deformations by combining the influences of at least two polygonal models if the two polygonal models from each respective progression of figures were present in the same scene.

Regarding claims 9 and 10, though Milliron teaches passing a representation of an undeformed point in column 11 lines 9-22 and column 15 lines 63-67, therefore it would have been obvious to also pass a representation of a deformed point in order to modify or change the deformation that was performed on the original point, such as to perform corrections to unwanted visual errors or effects that may appear after deformation of a model as described in column 25 lines 18-23.

Regarding claims 11, 46 and 75, Milliron illustrates a blend binding mode in the progression through Figures 15A-D, where it shown that the original model shown in Figure 15A is deformed over a certain interval and the deformation is interpolated from the previous frame is applied to each succeeding frame as well, which is also illustrated in Figure 17A-D and is also described in column 16 lines 34-37.

Regarding claims 13, 48 and 77, Milliron teaches applying deformation using a hierarchal binding mode in column 12 lines 37-42 where it is described that a deformer binds to local centers of weighting coordinates for the vertices at 4100 and 4300, as shown in Figure 4A, and adjusts the vertices of the object to the location of the target feature, resulting in the deformation illustrated in Figure 4B.

Regarding claims 14, 49 and 78, Milliron teaches applying deformations to a local origin point of an input binding site specified by a warp designer that provides the input in column 13 lines 6-12.

Regarding claims 15, 35, 50, 64 and 93, Milliron teaches a user-specified weight parameter that indicates a weighting factor and controls the relative amount of deformation applied by the node in column 3 lines 1-9.

Regarding claims 16, 51 and 80, Milliron teaches a generated output that is the weighted combination of input and the result of an applied deformation in column 16 lines 59-67.

Regarding claims 17, 52 and 81, Milliron teaches normalized weights in column 12 lines 28-29 that are used for the set of weight fields which effects the model over the entire pipeline until the final deformed model is generated as illustrated in Figure 7C.

Regarding claims 19, 53 and 82, Milliron illustrates determining a binding site for at least one control vertex 16100 in Figure 16B, teaches transforming the binding site in column 2lines 51-55, illustrates propagating the transformation of the binding site to the control vertex of the object to establish a new location of the control vertex 16100 in Figure 16C and shows deforming the object according to the new location of the control vertex in Figure 16D.

Regarding claims 20, 54 and 83, Milliron illustrates binding site locations that are in a subdivision surface in Figures 15C and 16B.

Regarding claims 21, 55 and 84, Milliron illustrates binding sites as component of a polygonal proxy model in Figure 16B, propagating transformation comprises deforming a subdivision surface as illustrated in Figure 16C, and where the subdivision surface passes smooth deformations to the control vertices column 30 lines 41-48.

Regarding claims 22, 56 and 85, Milliron fails to teach a deformation node that passes data stream output for another node, where the data stream output comprises a representation of the deformed object. Silva et al. teaches that the deformation nodes generates data stream output comprising a representation of the deformed object in column 6 lines 44-51 where it is described that each node in the modifier stack 280 illustrated in Figure 2 provides output of the representation f the object and is provided as data for the input of another modifier or node. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron with Silva et al. because this combination would provide various deformations to be applied to an object enabling accurate deformation animation.

Regarding claim 23, 57 and 86, Milliron fails to teach a plurality of binding items to be deformed by deformation nodes. Silva et al. illustrates a data stream in Figure 2 that comprises a

plurality of binding items defined by the world space modifier illustrated as element 800, as described in column 8 lines 56-65, which is deformed by a deformation node 720. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron with Silva et al. because this combination would provide visually smooth and accurate deformations of objects by binding the object and allowing the control points of the binded object to be deformed appropriately.

Regarding claims 24, 25, 58, 59, 87 and 88, Milliron fails to teach the binding items comprising tags specifying binding modes and a deformation node that applies deformations on binding items having a tag specify a matching binding mode. Regarding claims 24, 58, and 87, Silva et al. illustrates tags that specify world space modifiers that bind objects in Figure 8 as element 800, and it is also described in column 10 lines 4-9, therefore one of ordinary skill in the art would be capable of providing tags specifying binding modes that provide the user with visual indication of the current binding mode, which reduces the complexity of the user interface and improves the usability of the system. Regarding claims 25, 59, and 88, Silva et al. teaches performing deformation on an object specifying that it is bound to the world space modifier in column 8 lines 56-65 and is also illustrated in Figure 8, therefore the deformation or transform node 203, as illustrated in Figure 2, performs deformation on the object in the manner in which it is binded as illustrated in the progression through Figures 8-11. Silva et al. also illustrates in Figure 8 performing deformation to an object 810 based on the tag 800 that specifies how the object is binded and deformed in reponse to the tag designation. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron with Silva et al. because this combination would provide an efficient user interface that displays tags designating binding

modes applied to an object that effects only the object that are binded, thereby reducing the complexity of the animation process.

Regarding claims 26 and 27, Milliron fails to teach a filter node for modifying tags and at least one binding item that comprises a tag that specifies that node deformation are to be applied where the deformation nodes allow the binding item having the tag to pass without deformation. Regarding claims 26 and 29, Silva et al. inherently teaches a filter or masking of the tags specifying the deformation to be applied on the object in the progression of Figures 8-11 where it is shown that the object 700 is deformed in response to the deformation type it is bound to, therefore as the tag is changed or modified using the modifier selection, illustrated in Figure 4 as the interface 420, and the deformation of the object is therefore modified responsive to the modification of the tag as described in column 8 lines 56-65. Regarding claims 27 and 29, Silva et al. teaches a binding item that comprises a tag, as illustrated in Figure 8 as 800, which may specify no applied deformations in column 8 lines 58-62 and therefore allow the tag designated to that object without deformation to pass through a pipeline, as described in column 10 lines 41-47 and column 11 lines 34-36. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron with Silva et al. because this combination would provide a user friendly interface that specifies which binding mode is associated with a deformed object.

Regarding claim 30, Milliron teaches that the deformation is performed by graphics hardware in column 9 lines 64-67 and column 10 lines 8-10, therefore each node comprises a graphics hardware component.

Regarding claims 33, 62 and 91, Milliron teaches user specified features or attributes that specify the deformation of the model in column 11 lines 1-5 and column 2 lines 52-55, therefore the user would posses the capability to disable, as well as enable, the deformation.

Regarding claims 34, 63 and 92, Milliron teaches a use-specified attribute indicating a blending mode in column 21 lines 26-29 and column 30 lines 58-60.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Milliron (US Patent 6,608,631) in view of Silva et al.(US Patent 6,061,067) in further view of Fowler (US Patent 5,892,691).

Regarding claim 18, Milliron and Silva et al. fail to teach weights that are not normalized. Fowler teaches that weights may be normalized in column 11 lines 3-9, which inherently implies that the weights may also not be normalized as well. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron, Silva et al. and Fowler because this combination would provide the flexibility to enable the determination of whether the weights on a model are normalized.

Claims 12, 31, 32, 47, 60, 61, 76, 89 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milliron (US Patent 6,608,631) in view of Silva et al.(US Patent 6,061,067) in further view of Berger (US 2005/0057569).

Regarding claims 12, 47 and 76, Milliron and Silva et al. fail to teaches at least a subset of the deformation nodes generating output that interpolates a current deformation with output of at least one other deformation node. Berger teaches interpolating a current deformation with the

output of another deformation in paragraph lines 0079 1-19, where it is described that the current deformation is interpolated with the target deformation, such as the output of another deformation. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron, Silva et al. and Berger because this combination would provide accurate deformation of an object that would enable several deformations to be interpolated in one resulting deformation animation.

Regarding claims 31, 60 and 89, Milliron illustrates a plurality of surfaces in Figures 15B and 16B. Milliron and Silva et al. teach all the limitations except a data stream that comprises at least one data block for each surface of the object and each deformation node applies a deformation by modifying at least one data block associated with the object surface being deformed. Berger teaches a data stream comprising a data block 21 for each surface in Figure 2. Berger also illustrates in Figure 2 modifying a data block 21 associated with the object surface and applying deformation 25, as described in paragraph 0093 lines 1-9. It would have been obvious to one of ordinary skill in the art to combine the teachings of Milliron, Silva et al. and Berger because this combination would provide proficient deformation of object by enabling the surfaces of any object to be passed through a data stream and performing the desired deformation to each surface.

Regarding claims 32, 61 and 90, Milliron and Silva et al. fails to teach surfaces associated with a plurality of control vertices comprising a binding item for each control vertex of the surface associated with the data block. Berger teaches that the data block 21 containing each surface, as illustrated in Figure 2, has a plurality of vertex positions related to the surface which are used to control the deformation of the surface in paragraph 0074 lines 1-5, therefore

the control vertices bind the surface of the object. The motivation to combine the teachings of Milliron, Silva et al. and Berger is equivalent to the motivation of claim 31.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Said Broome whose telephone number is (571)272-2931. The examiner can normally be reached on 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Broome SB
2/16/06

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